

TARGET ZERO TEAM PROJECT
DUI ZONE IDENTIFICATION AND BASELINE DATA
2005-2009

SNOHOMISH COUNTY



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UNDER THE INFLUENCE? UNDER ARREST! **TARGETZERO TEAMS**

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The following agencies participated in the production of this report:

Washington State Patrol

Washington State Department of Transportation

Washington Traffic Safety Commission

Pierce County Sheriff's Office/Northwest Regional Crime Analyst Network (NORCAN) representative

Law Enforcement Information Exchange (LinX)

COUNTY CHARACTERISTICS AND SUMMARY

Snohomish County ranks third in overall population after King and Pierce counties.

According to the U.S. Census Bureau, the county has a total area of 2,196 square miles (5,689 km²), of which, 2,089 square miles (5,411 km²) of it is land and 107 square miles (278 km²) of it (4.89%) is water. Sixty-eight percent of the county land area is forest land, 18% is rural, 9% is urban/city and 5% is agricultural.



Category	Snohomish County
Population	704,300
Square Miles	2,089
Density per Sq Mile	337.1
Licensed Drivers	492,231
Registered Vehicles	716,609

Notable sites:

- The Boeing Company
- Naval Station Everett
- Fluke Corporation (electronic testing equipment)
- Verizon (telecommunications)
- Kimberly-Clark Corp., Intermec (bar code manufacturing)
- Tulalip Indian Reservation

- Population and density statistics, licensed driver and registered vehicle statistics obtained from OFM, 2009
- Total state route miles obtained from WSDOT TRIPS system "State Route 'Annual Vehicle Miles County, Functional Class, and Rural/Urban A.V.M.T. (Annual Vehicle Miles Traveled) in Thousands' report available on WSDOT website.

FATAL COLLISIONS—SNOHOMISH COUNTY

Total Fatal Collisions in Snohomish County by Road Type and Year, 2005-2009

Road Type	2005	2006	2007	2008	2009	Total
City Street	3	7	5	3	9	27
County Road	8	8	10	11	8	45
State Route	9	11	10	5	4	39
Grand Total	20	26	25	19	21	111

Source: FARS

Overview

- Most Fatal Collisions happened on County Roads followed by State Routes.
- In 2009 there were two more fatal collisions than the previous year.
- The 111 Fatal Collisions resulted in 122 deaths.



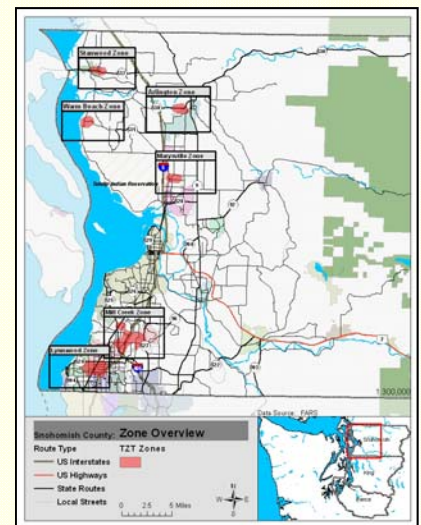
DUI ZONE IDENTIFICATION

The Target Zero Team Project goal aims to significantly reduce fatal and serious injuries involving impaired drivers. Therefore, enforcement efforts should be focused on areas with high numbers of fatal and serious injury crashes involving alcohol or drugs.

Identify Zones of High Activity

Target Zero Zones have been identified through GIS Analysis and ranked according to the following features:

- Areas were first calculated by density (incidents are closer to one another than other areas) of Impaired Fatal Collisions between 2005 and 2009 . Areas were then further classified by the raw number of incidents within each Zone.
- Data from each Zone is extracted out and summarized for details specific to that Zone: time of day, day of week, BAC levels, speed, seat belt use, etc.
- As the project continues, Zones will be monitored for changes in behavior, times, and monitored activity within and surrounding the Zones.



For larger view see page 7.

Baseline Data

Total Fatal Collisions and Total Fatal DUI-Related Collisions
(2005-2009, FARS Data)

Citizen Reports of Possible DUI, Erratically Driven Vehicles, and Wrong-Way Drivers
(2007-2009, WSP CAD 9-11 Data)

DUI Fatal Collisions— result from crash involving one or more drivers with positive BAC (blood alcohol content of >0) or police reported alcohol involvement or positive drug test.



SNOHOMISH COUNTY FATAL DUI COLLISION ZONE IDENTIFICATION

Zone Name	Characteristics	Number of Fatal Impaired Driver Collisions	Number of People Killed in Impaired Driver Collisions
Stanwood Zone	<p>Fatal Crashes: Two out of three fatal collisions occurred at midnight. Two collisions were speed related and one was caused by a distracted driver. Two collisions occurred during clear or partly cloudy weather. Two collisions happened on city streets and one on a county road.</p> <p>Citizen Reports: Between 2007 and 2009, there were 70 citizen reports of possible DUI or erratically driven vehicles to WSP via 911 in this zone and calls peaked on Saturdays and Mondays. Additionally the number of calls peaked around 4pm and between 8pm and 10pm.</p>	3	3
Arlington Zone	<p>Fatal Crashes: All fatal collisions occurred in 2005 and 2006. These collisions occurred between 8pm and 3am and two of them occurred during overcast weather.</p> <p>Citizen Reports: Within this zone, there were 126 citizen reports of possible DUI, wrong way vehicles or erratically driven vehicles to WSP via 911 (2007-2009). Number of calls peaked on Mondays and Saturdays.</p>	3	3
Warm Beach Zone	<p>Fatal Crashes: Two out of three fatal collisions were speed related. Two collisions occurred on Sundays between 8pm and 10pm. All three collisions occurred during clear or partly cloudy weather.</p> <p>Citizen Reports: There were no citizen reports of possible DUI, wrong way vehicles or erratically driven vehicles to WSP via 9-11 (2007-2009) in this zone.</p>	3	3
Marysville Zone	<p>Fatal Crashes: Two of the three impaired driving fatal collisions occurred on a rainy day between 10pm and 3am. All three collisions were speed related and occurred during weekend, two on Saturdays and one on Sunday.</p> <p>Citizens Reports: There were no citizen reports of possible DUI, wrong way vehicles or erratically driven vehicles to WSP via 9-11 (2007-2009) in this zone.</p>	3	3
Mill Creek Zone	<p>Fatal Crashes: Five of the ten impaired driving collisions occurred on Sundays. One out of ten vehicles was stolen. Only one collision occurred during rainy conditions.</p> <p>Citizens Reports: Between 2007 and 2009, there were 2,389 citizen reports of possible DUI or erratically driven vehicles. There is a steady increase of calls starting at noon with peak hours between 6pm and 11pm. Saturdays followed by Fridays and then Sundays have the highest number of possible DUIs.</p>	10	11
Lynnwood Zone	<p>Fatal Crashes: Five out of seven impaired driving fatal collisions were speed related and five occurred between 8pm and 11pm. One vehicle was stolen.</p> <p>Citizens Reports: Between 2007 and 2009, there were 99 citizen reports of possible DUI or erratically driven vehicles. Most calls came on Saturdays followed by Sundays, and then Thursdays.</p>	7	7

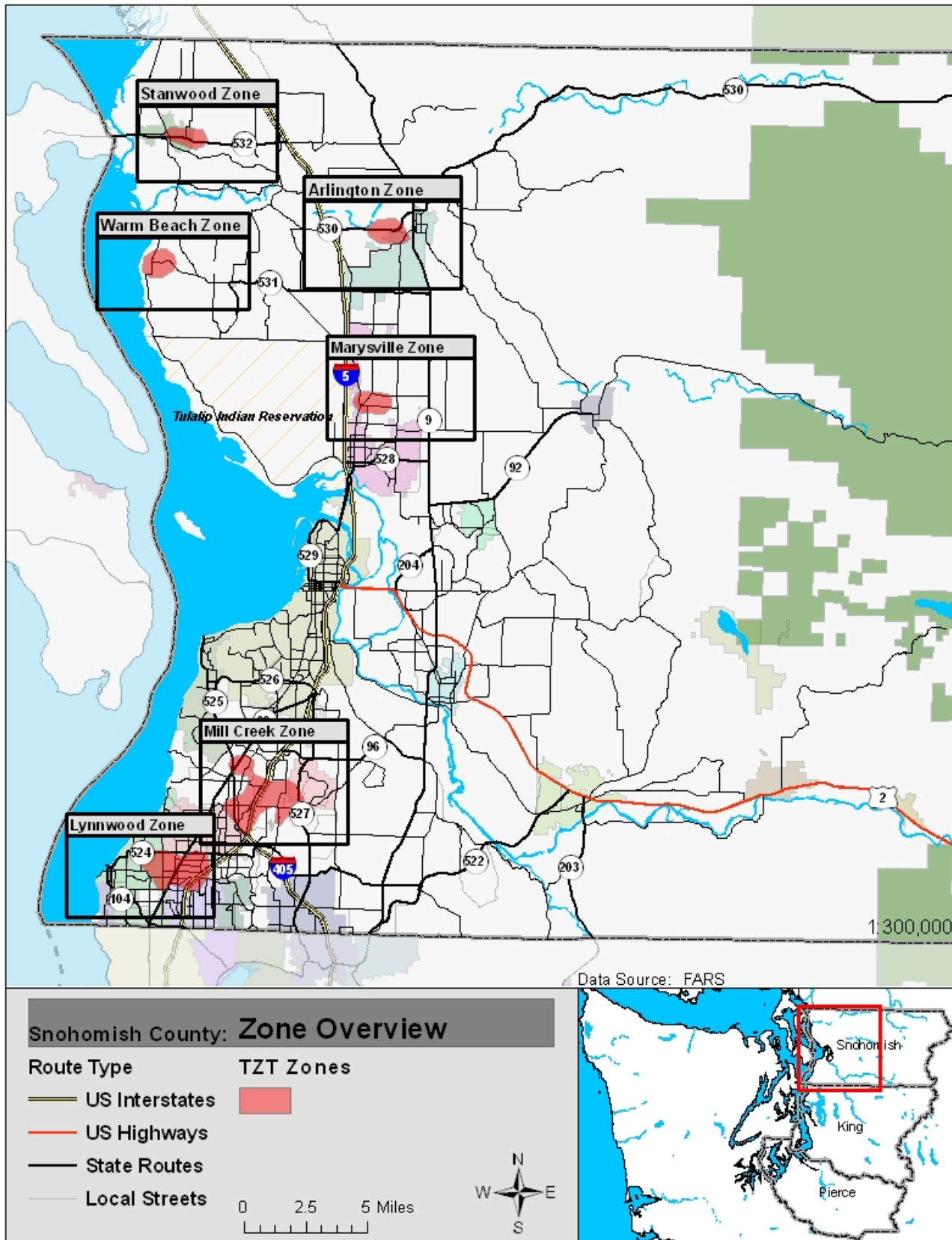
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ZONES

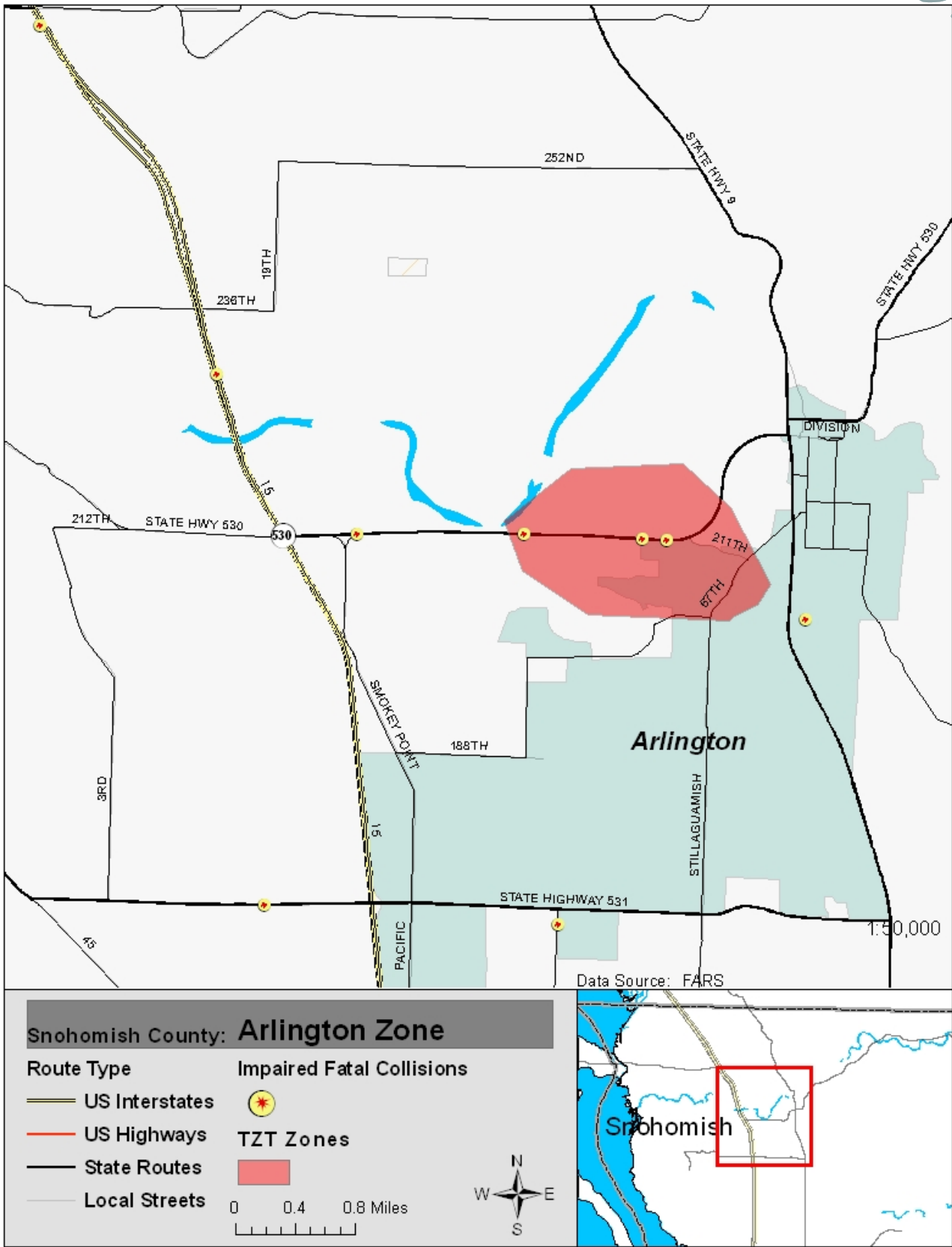
SNOHOMISH FATAL DUI COLLISION ZONE IDENTIFICATION



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SNOHOMISH COUNTY: ARLINGTON ZONE



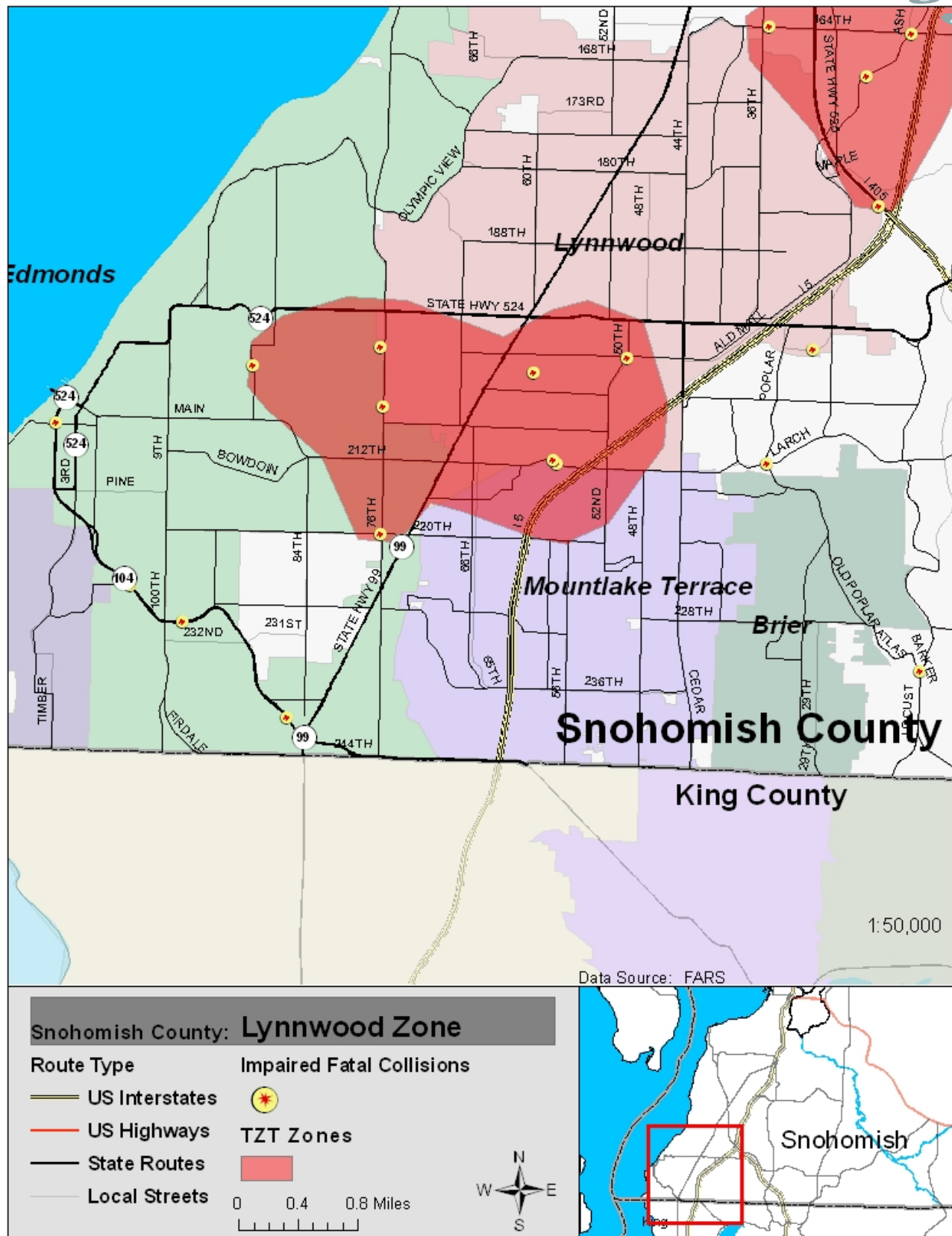
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ZONES

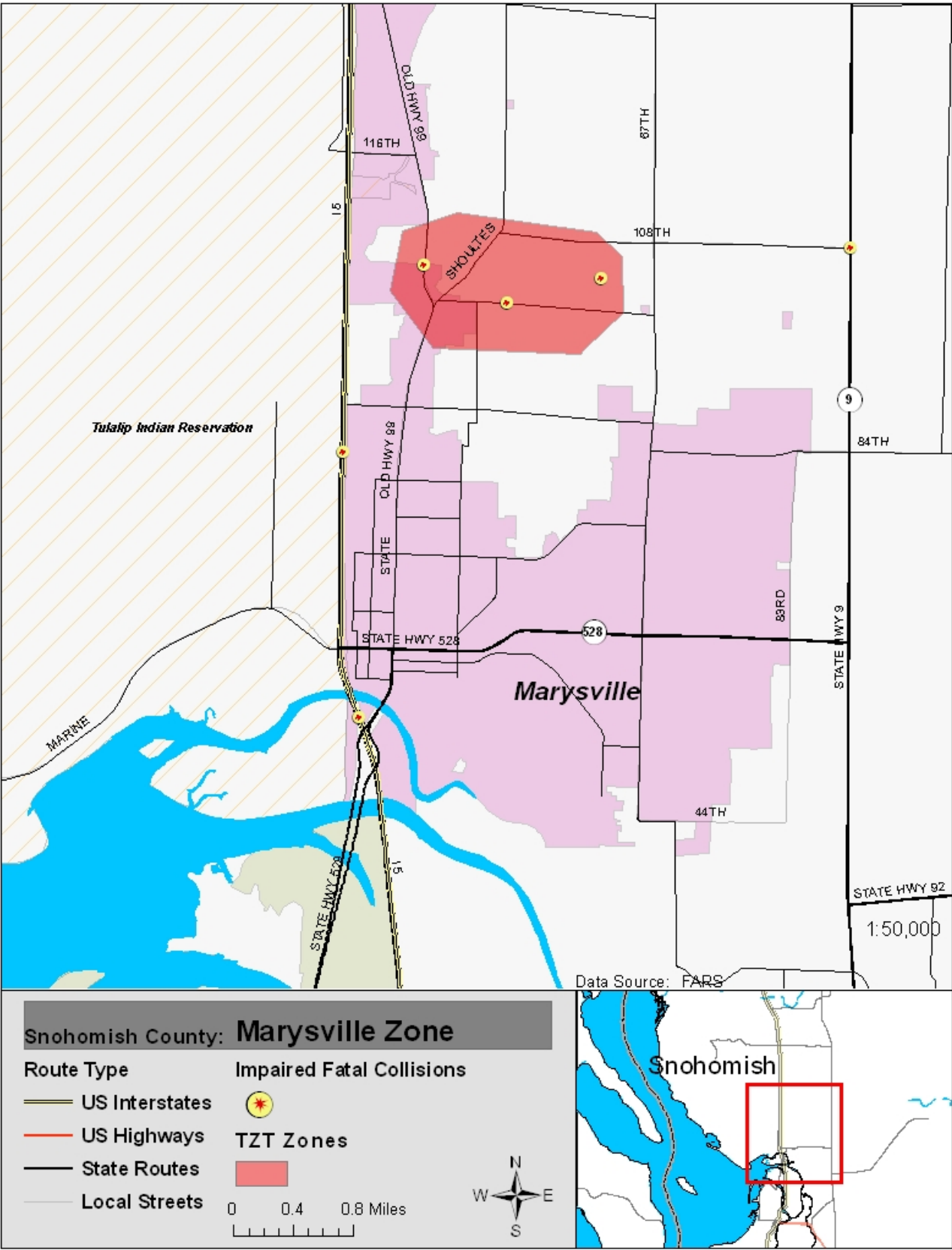
SNOHOMISH COUNTY: LYNNWOOD ZONE



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SNOHOMISH COUNTY: MARYSVILLE ZONE



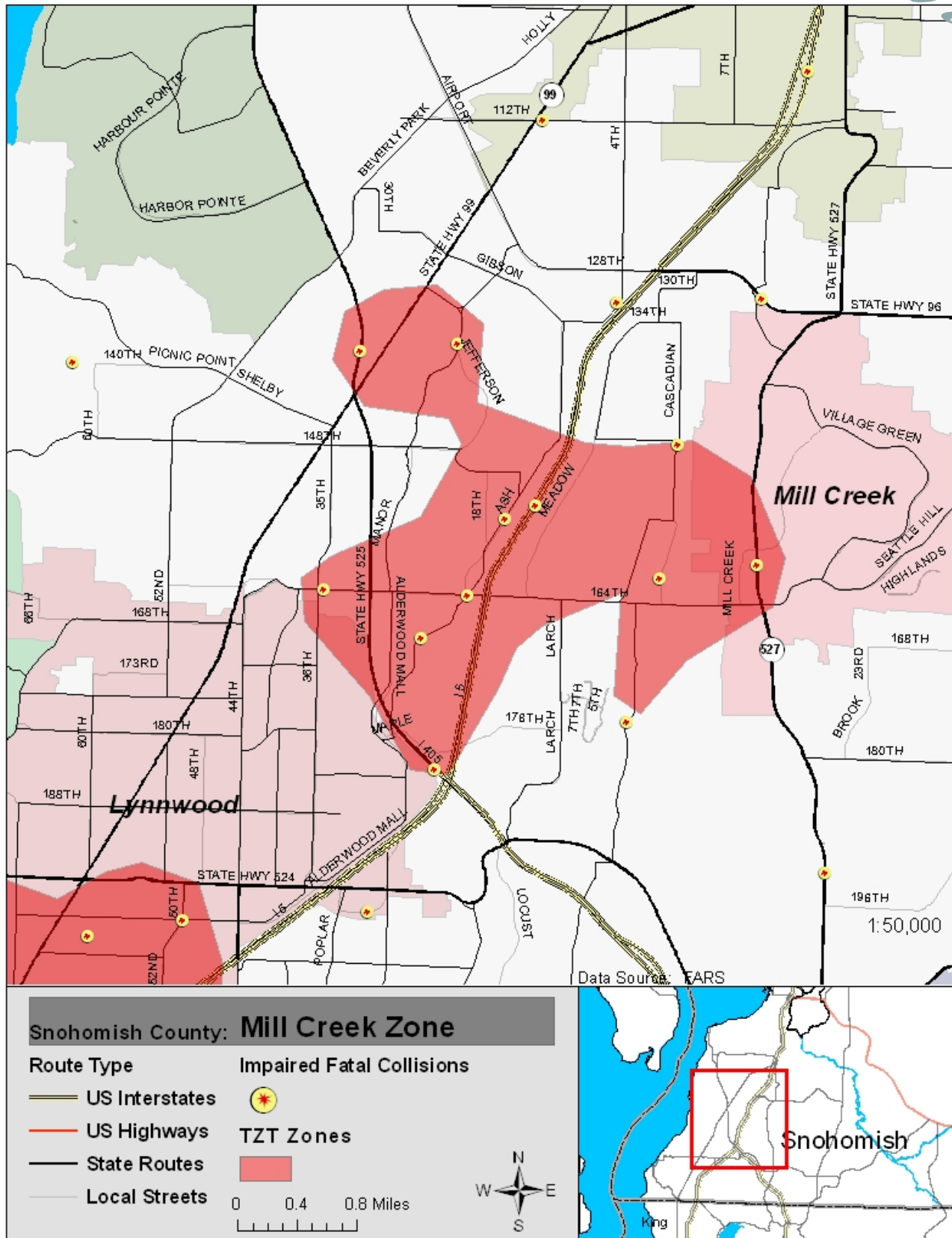
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TARGET ZERO TEAMS



ZONES

SNOHOMISH COUNTY: MILL CREEK ZONE

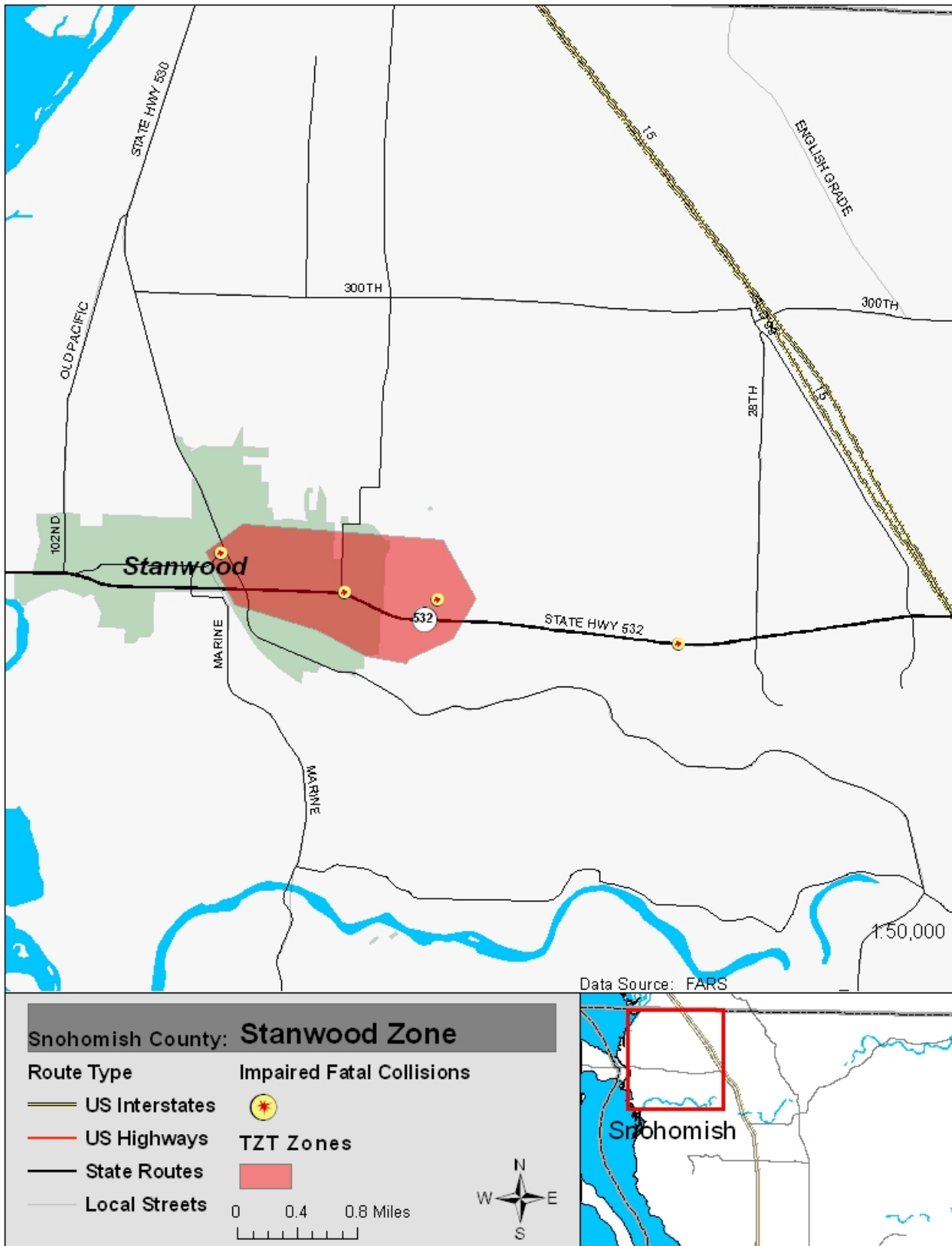


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SNOHOMISH COUNTY: STANWOOD ZONE



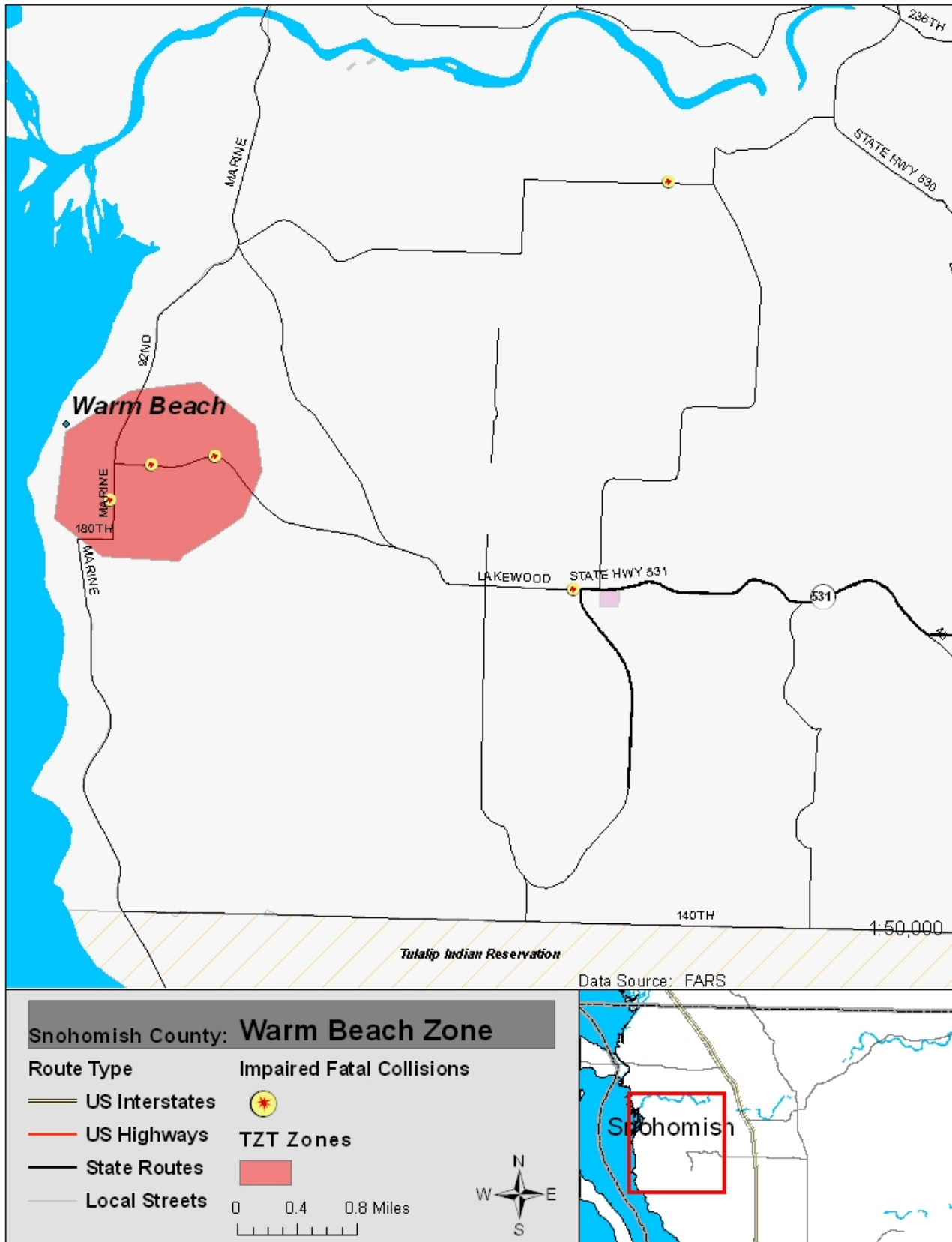
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TARGET ZERO TEAMS

ZONES



SNOHOMISH COUNTY: WARM BEACH ZONE





SNOHOMISH COUNTY BASELINE: IMPAIRED FATAL COLLISIONS

Impaired Fatal Collisions by Month and Year, 2005-2009

MONTH	2005	2006	2007	2008	2009	Total
Jan	2	1	0	3	2	8
Feb	3	3	3	0	0	9
Mar	1	3	1	0	1	6
Apr	1	2	1	3	1	8
May	3	1	3	3	1	11
Jun	4	2	5	1	1	13
Jul	0	5	2	0	1	8
Aug	1	1	0	3	5	10
Sep	0	4	4	3	1	12
Oct	3	1	3	0	3	10
Nov	0	0	1	1	3	5
Dec	2	3	2	2	2	11
Total	20	26	25	19	21	111

Overview

- Out of 210 Fatal Collisions, 111 (53%) were Impaired Fatal Collisions.
- Out of 111 Impaired Fatal Collisions 69 were speed related, 4 were hit and run, and 4 vehicles were stolen.
- Most fatal collisions occurred in June and November had the smallest number.
- Out of 111 Impaired Fatal Collisions, 84 were investigated by Municipal or City Police and County Sheriffs Office.

Overview

- Five Impaired Fatal Collisions involved a pedestrian.
- The highest number of Impaired Fatal Collisions happened on Sundays, followed by Saturdays, and Thursdays.
- The highest number of collisions happened at 2am followed by 8pm and midnight.

Legend

- Low
- Medium
- High

Impaired Fatal Collisions by Day of Week and Time of Day With Daily and Hourly Index, 2005-2009

HOURLY	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Total	Hourly Index
00	3	1	1	0	0	2	2	9	1.95
01	3	0	0	0	1	0	0	4	0.86
02	4	1	1	2	2	1	4	15	3.24
03	1	0	0	0	2	0	2	5	1.08
04	2	0	0	0	0	1	1	4	0.86
05	0	1	0	0	0	0	0	1	0.22
06	1	0	0	0	0	1	0	2	0.43
07	1	0	1	0	1	0	0	3	0.65
08	0	0	0	1	0	0	0	1	0.22
09	1	0	1	0	0	0	0	2	0.43
10	1	0	0	0	0	1	0	2	0.43
11	0	0	0	0	2	1	1	4	0.86
12	0	0	0	0	1	0	0	1	0.22
13	1	1	0	0	0	0	1	3	0.65
14	0	0	0	1	1	0	0	2	0.43
15	0	1	1	1	0	1	1	5	1.08
16	0	0	0	3	0	1	0	4	0.86
17	0	0	0	1	2	1	2	6	1.30
18	1	0	1	1	1	1	0	5	1.08
19	0	1	0	1	2	0	2	6	1.30
20	3	3	1	1	0	0	2	10	2.16
21	0	0	0	0	1	0	1	2	0.43
22	3	2	0	0	0	2	2	9	1.95
23	1	0	2	0	0	1	2	6	1.30
TOTAL	26	11	9	12	16	14	23	111	
Daily Index	1.64	0.69	0.57	0.76	1.01	0.88	1.45		

* An index of >1 is considered above average

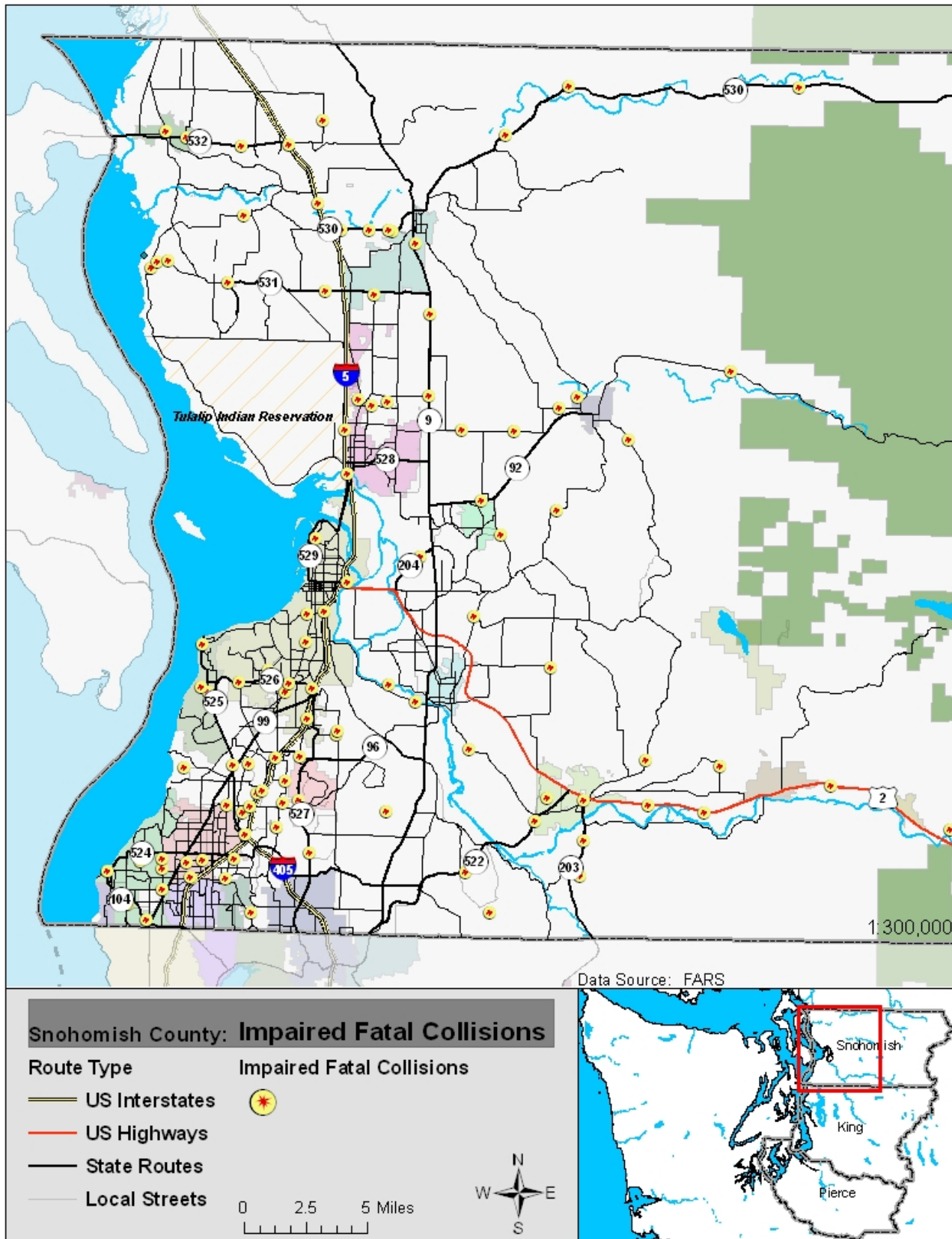
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SNOHOMISH COUNTY BASELINE: IMPAIRED FATAL COLLISIONS

BASELINE





SNOHOMISH COUNTY BASELINE:

CITIZEN REPORTS OF POSSIBLE DUI, 2007-2009

Baseline Citizen Reports of Possible DUI Data by Month and Year with Seasonal Index, 2007-2009

	2007	2008	2009	Total	Mean	Index
Jan	1021	1070	921	3012	1004.00	0.83
Feb	1115	1242	954	3311	1103.67	0.91
Mar	1279	1177	985	3441	1147.00	0.94
Apr	1350	1166	1100	3616	1205.33	0.99
May	1443	1307	1221	3971	1323.67	1.09
Jun	1586	1269	1269	4124	1374.67	1.13
Jul	1641	1284	1222	4147	1382.33	1.14
Aug	1588	1345	1322	4255	1418.33	1.17
Sept	1469	1151	1246	3866	1288.67	1.06
Oct	1377	1083	1058	3518	1172.67	0.96
Nov	1230	1035	961	3226	1075.33	0.88
Dec	1242	801	1229	3272	1090.67	0.90
Total	16341	13930	13488	43759		

Overview

- Possible DUI Citizen Reports decreased by 2853 calls in Snohomish County between 2007 and 2009, for an increase of 17.5%.
- Citizen Reports averaged 36.9 calls per day in 2009.
- Months with the highest number of calls for possible DUIs or erratically driven vehicles are: August, July, and June.

Overview

- Citizen Reports of Possible DUI chart by Day of Week indicates: Saturdays, followed by Fridays, and Sundays had highest number of possible DUIs or erratically driven vehicles.
- According to the Index column, time between 4:00pm and 6:00 pm has the highest number of

Legend

- Low
- Medium
- High

Citizen Reports of Possible DUI by Time of Day and Day of Week with Hourly Index, 2007-2009

	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Total	Mean	Index
0	430	174	130	132	140	173	388	1567	223.86	\$0.86
1	367	102	93	101	111	133	341	1248	178.29	\$0.68
2	309	85	68	78	81	120	278	1019	145.57	\$0.56
3	156	42	46	69	57	82	163	615	87.86	\$0.34
4	104	58	64	69	86	69	97	547	78.14	\$0.30
5	69	66	100	88	112	95	89	619	88.43	\$0.34
6	76	119	127	143	136	133	104	838	119.71	\$0.46
7	61	131	144	162	153	141	96	888	126.86	\$0.49
8	84	164	167	152	177	185	156	1085	155.00	\$0.60
9	151	183	184	167	218	212	227	1342	191.71	\$0.74
10	216	185	172	186	222	255	271	1507	215.29	\$0.83
11	244	212	246	232	250	274	318	1776	253.71	\$0.97
12	275	266	259	252	250	349	326	1977	282.43	\$1.08
13	324	320	255	287	301	378	412	2277	325.29	\$1.25
14	360	326	313	358	360	385	382	2484	354.86	\$1.36
15	346	317	345	345	363	398	401	2515	359.29	\$1.38
16	407	370	372	348	368	411	388	2664	380.57	\$1.46
17	441	375	372	353	384	469	512	2906	415.14	\$1.59
18	403	418	340	348	387	477	449	2822	403.14	\$1.55
19	442	318	325	357	366	435	469	2712	387.43	\$1.49
20	427	282	338	352	370	458	450	2677	382.43	\$1.47
21	353	334	315	356	413	513	545	2829	404.14	\$1.55
22	301	283	294	284	334	572	615	2683	383.29	\$1.47
23	226	181	215	232	255	475	578	2162	308.86	\$1.19
Total	6572	5311	5284	5451	5894	7192	8055	43759		

* An index of >1 is considered above average

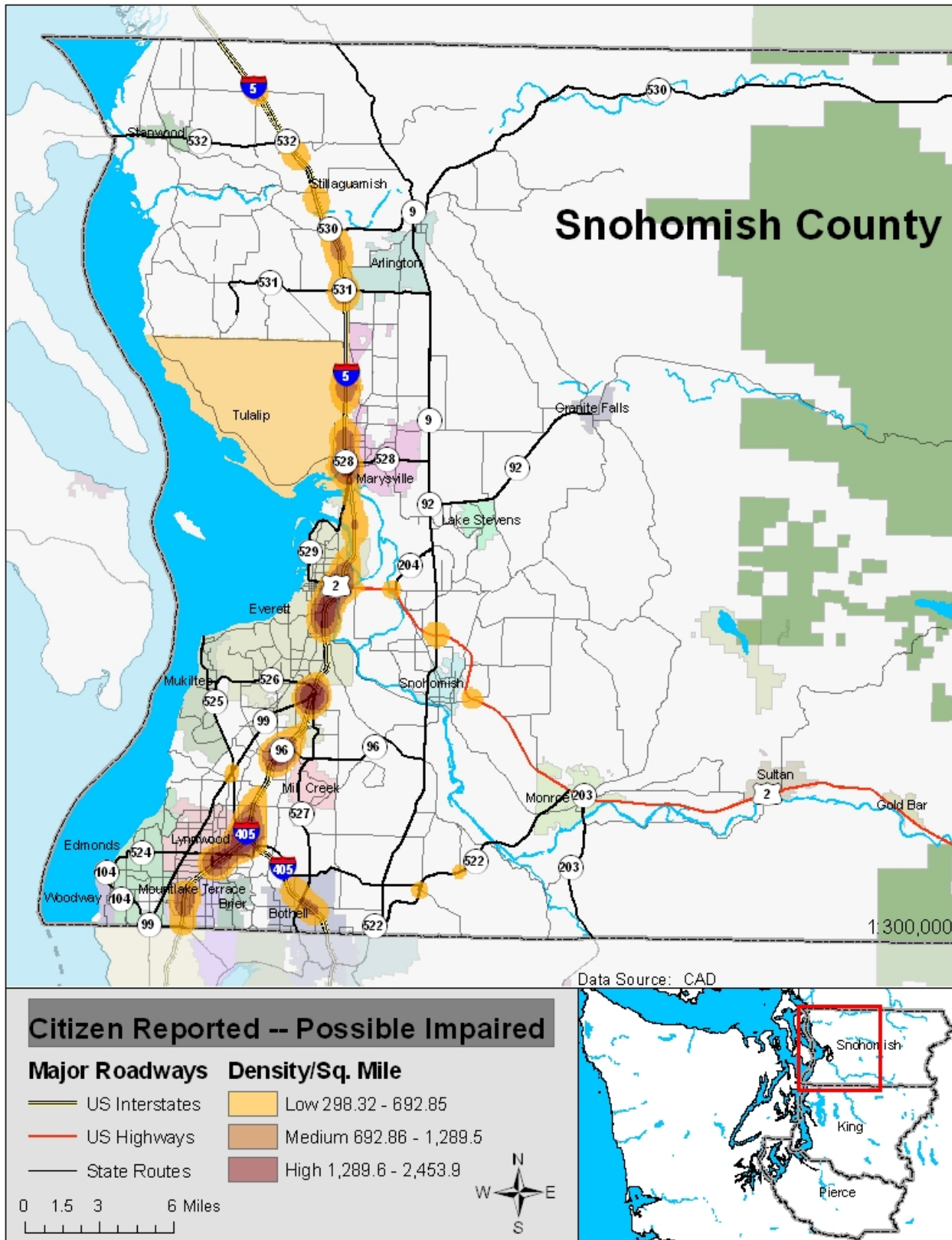
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SNOHOMISH COUNTY: CITIZEN REPORTS OF POSSIBLE DUI

BASELINE



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SNOHOMISH COUNTY BASELINE: CRIME DATA

Crime—Uniform Crime Report, 2006-2008

The tables below represent information for Snohomish County for the years of 2006 through 2008. Each table represents a different aspect of the Uniform Crime Report. As a result, the totals in each table will not match because they represent number of crimes, number of subjects arrested, and number of court cases.

Reported Index Crimes:

- 2008 reported crimes had decreased by 16.8% from 2007.
- 2007 reported crimes decreased by 4.1% from 2006.
- Over the period of three years, number of reported crimes had decreased by 20.2%.

Reported Index Crimes - Washington Association of Sheriffs and Police Chiefs

Calendar Year	2006	2007	2008
Murder	14	17	7
Forcible Rape	225	278	230
Aggravated Assault	770	785	857
Robbery	487	498	488
Arson	158	154	136
Burglary	4,678	5,001	4,289
Theft	15,889	15,497	13,754
Motor Vehicle Theft	6,148	4,973	2,874
Total	28,369	27,203	22,635

Number of total arrests:

- Arrests in 2008 had decreased by 7.5% from 2007.
- Arrests in 2007 had increased by 5.7%.
- Over the period of three years, number of arrested adults had decreased by 2.2%.

Adult Arrests - Washington Association of Sheriffs and Police Chiefs

Calendar Year	2006	2007	2008
Murder	8	15	8
Forcible Rape	75	67	95
Aggravated Assault	310	357	432
Robbery	142	167	123
Arson	13	18	16
Burglary	298	339	292
Theft	2,185	2,512	2,436
Motor Vehicle Theft	98	95	74
Drug Crimes	1,663	1,678	1,567
Other Crimes	10,173	10,570	9,594
Total	14,965	15,818	14,637

Superior Court Filing:

- Number of filled court cases in 2008 decreased by 23.4% from 2007.
- Number of court cases in 2007 increased by 19.9% over 2006.
- Over the period of three years, superior court filings decreased by 8.2%.

Superior Court Filings - Office of the Administrator for the Courts

Calendar Year	2006	2007	2008
Homicide	14	27	21
Sex Crimes	166	189	247
Robbery	78	64	70
Assault	239	262	224
Property Crimes	1,150	1,317	998
Drug Crimes	802	1,059	704
Other Felonies	533	577	377
Total	2,982	3,575	2,737

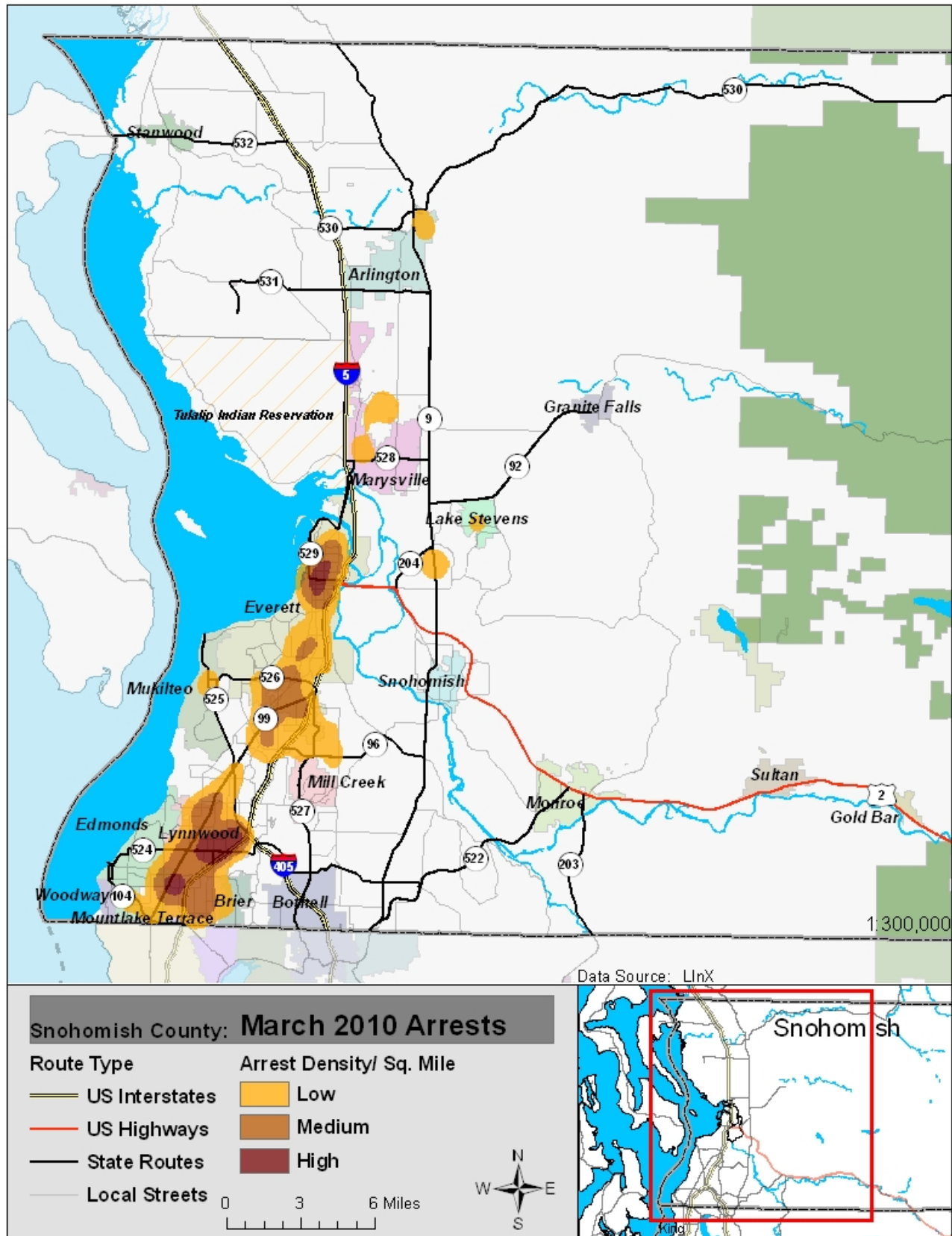
Source: (Office of Financial Management, 2009)

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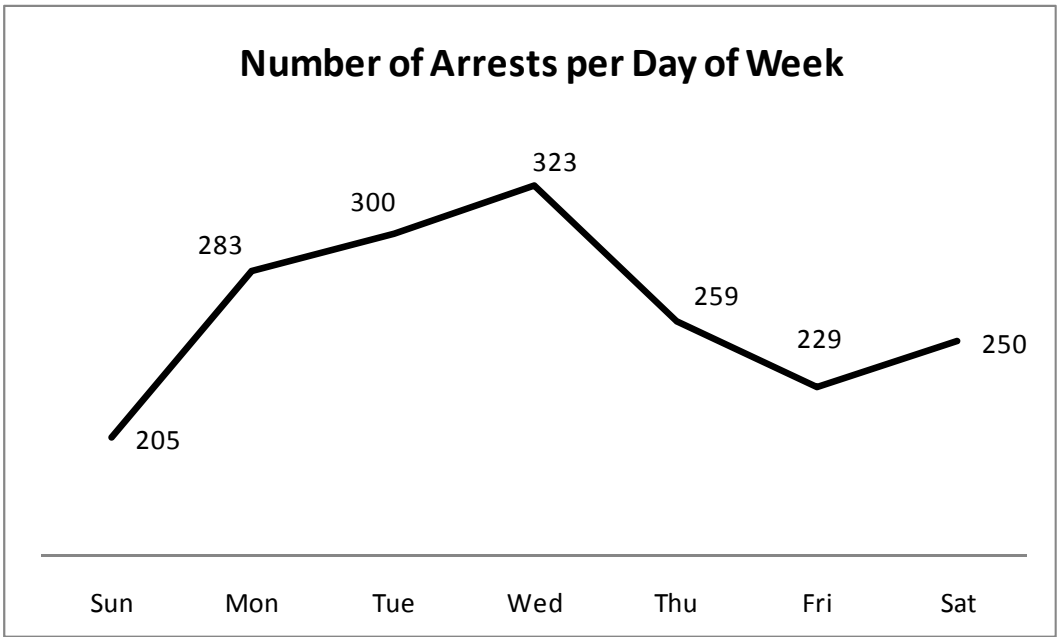
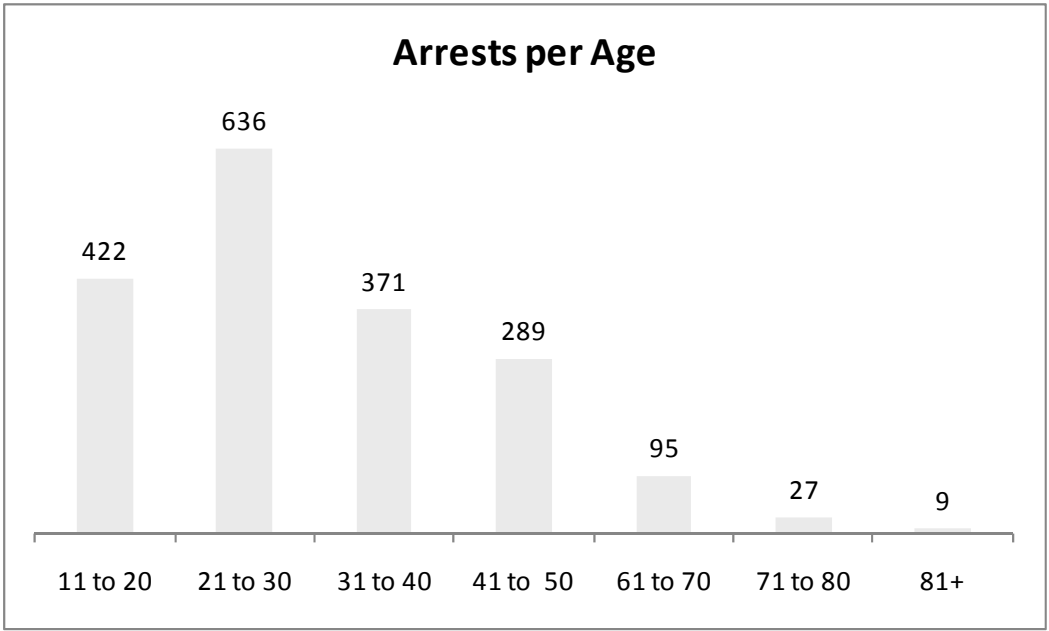
SNOHOMISH COUNTY BASELINE: CRIME DATA

BASELINE



SNOHOMISH COUNTY BASELINE: CRIME DATA

The information for the Crime Data comes from the Law Enforcement Information Exchange (LinX). The tables below represent arrests that occurred within Snohomish County during March 2010. The following agencies data is included: Arlington PD, Bothell PD, Brier PD, Edmonds PD, Everett PD, Lake Stevens PD, Law Enforcement Support Agency Lynnwood PD, Marysville PD, Mill Creek PD, Monroe PD, Mountlake Terrace PD, Mukilteo PD, Snohomish County Sherriff's Office, Stanwood PD, Sultan PD, Washington State Patrol, Woodway PD.



Source: LinX, March 2010

BASELINE

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APPENDIX: METHODOLOGY

Statistical Calculations

Seasonal and Hourly Index Calculations

Mean—The sum of the cases for a specific time frame divided by the total number of cases.

For example, the Mean of January takes the sum of each January (2007, 2008, 2009) and divides it by three.

The Seasonal Index indicates when a month is above or below average activity — 1 equals average activity.

To calculate the Seasonal Index, find the Mean of the means (Grand Mean), then divide the monthly mean by the Grand Mean.

Temporal Charts

Temporal Charts are broken out into “High, Med-High, Low” by taking the highest number and dividing by four to calculate ranges

Zone Activity Chart

Consists of a basic Excel Surface Chart, which finds the peak numbers of collisions and creates patterns that allow for comparisons and detection of movement through time and space across zones.

Kernel Density

Kernel Density calculates the density of a group of features (collisions, calls for service, arrest locations, etc.) around a specific grid structure. The density is calculated using a 1 mile search radius and measured in features per square mile. The density value is highest at the location of the feature and diminishes with increasing distance from the feature, reaching zero at the 1 mile search radius distance from the point.

FARS Data Set, 2005-2009

Fatal Collisions 05-09 (Merged Data)

2522 Spatial Features/ 2622 Total Records

96.1% of the Total Records (2622) are mapped